PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Sequestration

04/2004

DEVELOPMENT OF A CARBON MANAGEMENT GEOGRAPHIC INFORMATION SYSTEM (GIS) FOR THE UNITED STATES

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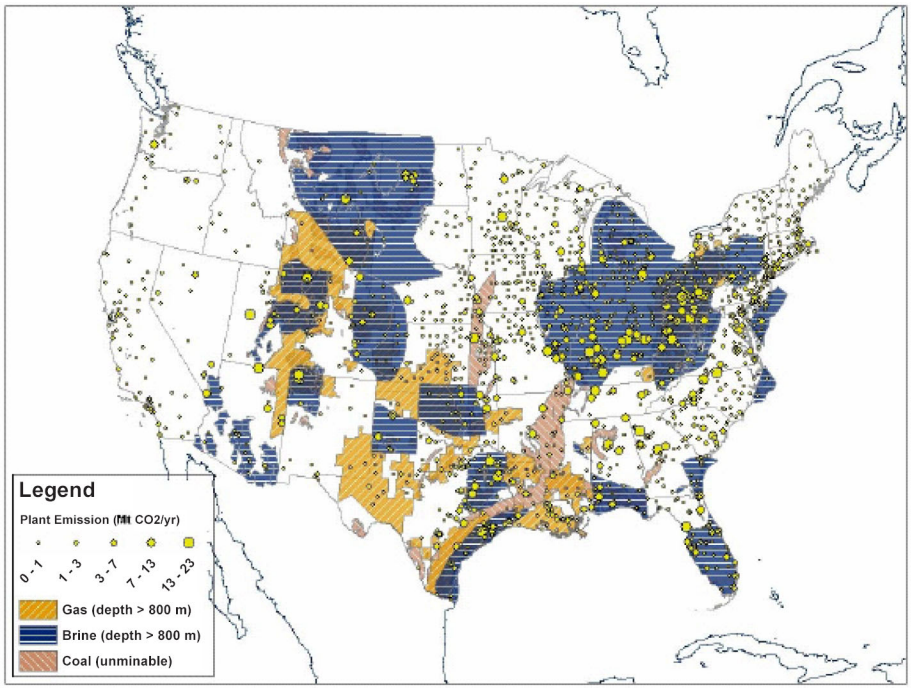
Background

This project will develop tools to provide DOE managers with the capability for real-time display and analysis of CO_2 sources, potential sequestration sinks, and other data, such as transportation corridors, within a spatial database. This type of program can assist decision makers by providing visual access to high quality, current, consistent data obtained from distributed datasets. The main tool being used is a Geographic Information System (GIS). The GIS tool will be used to model, analyze, and display spatial relationships between the data. The Massachusetts Institute of Technology's (MIT) Carbon Management (CM) system will employ GIS tools to support decision making within the CM system. MIT will use GIS software to prepare a user friendly model, which DOE will receive at the end of the project. Various social, economic, and political aspects of sequestration will also be part of the project.



A selection of data under consideration in MIT's Carbon Management System.

MIT will take a top-down approach to analyzing the potential for CO_2 capture and storage in the U.S. In order to avoid duplication of effort while conducting this effort, MIT will work closely with the ongoing Midcontinent Interactive Digital Carbon Atlas and Relational Database (MIDCARB) Consortium project, which is presently concerned with determining the carbon sequestration potential of five Midwestern states. The primary use of the Carbon Management GIS will be as a systems analysis tool that can be used on a local, regional, or national scale.

CUSTOMER SERVICE

1-800-553-7681

WEBSITE

www.netl.doe.gov

PARTNERS

Massachusetts Institute of Technology

Midcarb consortium

COST

Total Project Value

$1,062,106

DOE/Non-DOE Share

$849,685/$212,421

Primary Project Goal

The overall objective of this project is to develop an analysis tool to aid in the development and deployment of carbon capture and sequestration technologies within the U.S.

Objectives

- To develop a Carbon Management GIS for the purpose of capturing, integrating, manipulating and interpreting data relevant to carbon capture and sequestration.
- To use commercially available software and databases in the development of the CM system.
- To use freely available "core" data and convert it to an appropriate form for the GIS.
- To further develop supplemental data on costs and social issues, based on past work.
- To develop computer codes to perform analyses specific to carbon sequestration systems.
- To work with MIDCARB to provide internet access to the developed software in a manner similar to that already done by MIDCARB.
- To use the finished product to perform initial analyses.

Accomplishments

MIT has identified and incorporated data into the GIS. While this will be a continuing process, an initial set of data has been gathered into the GIS so basic analyses could be initiated. Installation of the web server and GIS viewer has been completed. MIT has produced a working prototype that incorporates the following points:

- Data requirements for primary carbon dioxide system: sources, transportation infrastructure and sinks.
- Data requirements for factors that may modify costs in the system: geography, topography.

Storage cost estimation has also been initiated. MIT has produced a cost map for single brine formation in Texas manually using ArcGIS Spatial Analysis Tools.

Benefits

One of the options for mitigating CO_2 emissions from power plants and other point sources is sequestration in geologic formations. However, to minimize costs, sources and sinks should be in close proximity. The software being developed in this project will permit rapid visualization of the relationship between CO_2 sources and potential sequestration sites. It will ultimately aid the DOE in the development of meaningful and economically feasible sequestration demonstration projects. Such projects are essential if sequestration is to become technically, economically, environmentally, and socially acceptable.